

REMARKS

The copy of the Information Disclosure Statement submitted by Applicant on November 16, 1999, was not initialed by the Examiner. Enclosed is a copy of the return receipt postcard in evidence that Applicant submitted copies of the identified references. Applicant requests that those references be considered in connection with the present application.

Reconsideration and allowance of the above-identified application are respectfully requested.

Upon entry of this amendment, claims 1-74, as amended, and newly added claims 75-81 will remain in the application.

Section 112 Rejections

Claims 33, 35, 36, 38, 39, 41, 42, 44, 49, 51, 57 and 59 were rejected under 35 U.S.C. 112, first paragraph, for allegedly containing material not supported by the specification as filed.

Plasma doping of the Group 15 metal finds support on page 12 lines 16-22, of the specification. The specification also teaches that the concentration of phosphorous is a digit higher than the concentration of the catalyst (nickel) on page 13, lines 4-9.

Claims 35, 38, 41, 44, 51, and 59 were rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. Specifically, the term "a digit higher" in regard to the concentrations is considered indefinite.

The term "a digit higher" refers to an order of magnitude higher which is clearly supported in the specification on page 13, lines 6-16.

#### Section 103 and Double Patenting Rejections

Claims 1-59 were rejected under obviousness-type double patenting as allegedly being unpatentable over claims 1-31 of Yamazaki et al. (U.S. 5,700,333).

Claims 1-16 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Yamazaki et al.

Applicants teach selectively doping portions of a crystalline semiconductor film with an impurity to getter a catalyst from another portion of the crystalline film to be used as an active layer in a transistor. Thus, gettering occurs laterally in the same layer, and after the gettering process, different portions of the same semiconductor layer contain different concentrations of the impurity and the catalyst. The doped regions are then removed, and the remaining island portion may be used as an active layer.

Yamazaki et al. does not disclose selectively implanting an impurity. Rather, the reference discloses implanting phosphorous indiscriminately over the entire crystallized silicon film. The implantation produces a highly doped amorphous layer which is removed and replaced with a deposited n-type crystalline semiconductor layer. Thus, gettering occurs in a vertical direction, with the catalyst material migrating vertically from the lower crystalline layer to the doped amorphous layer.

Consider exemplary claim 1, as amended, which recites in relevant part:

" . . . selectively introducing an impurity element belonging to Group 15 into a first portion of the crystalline semiconductor film;

gettering the element which promotes crystallization by a second heat treatment to the first portion of the crystallized semiconductor film;

patterning the crystallized semiconductor film to form a crystalline semiconductor island thereby removing the first portion of the crystalline semiconductor film; and

forming an active layer using the crystalline semiconductor island, . . . "

Independent claims 9, 17, 25, 45 and 52 recite similar limitations.

Yamazaki et al. does not teach or suggest selectively introducing an impurity for gettering into portions of the crystalline semiconductor layer, but rather indiscriminately into the entire crystalline semiconductor layer. Thus, the gettering process occurs in a different direction and the different portions of the resultant layer have different impurity concentrations. Accordingly, claims 1 and 9, and their dependencies, should be allowed and the double patenting rejection withdrawn.

Claims 17-59 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Yamazaki in view of Zhang et al. (U.S. 5,569,936).

Zhang was cited for its disclosure of using lasers to crystallize amorphous silicon. Zhang does not disclose implanting a material in a portion of the crystallize semiconductor layer for gettering the catalyst out of another portion and then removing the portion with the impurity and higher catalyst concentration. Neither Zhang nor Yamazaki, either alone or in combination, teach or suggest selectively introducing an impurity for gettering into portions of the


crystalline semiconductor layer Accordingly, independent claims 17, 25, 45, and 52, and their dependencies, should be allowed.

For the reasons stated above, Applicant submits that all of the claims are now in condition for allowance, and requests a prompt notice to that effect.

Please apply any charges not covered or any credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 7/27/00

  
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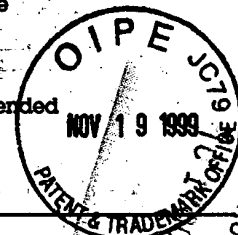
Applicant or Patentee Hidetoshi Ohnuma, et al.

No. (Application, Appeal, Interference, Patent, Reexam) 09/050,183

Filing or Issue Date 3/26/98

Title: Method of Manufacturing a Semiconductor Device

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